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EXAMINER
KUMABE, BLAKE K

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>11 April 2011</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____ ; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☐ Claim(s) <u>1-14 and 24-31</u> is/are pending in the application.

    5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) <u>1-14 and 24-31</u> is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on <u>09 October 2008</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____ .

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

1.   Claims 1-14 and 25-31 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claims 1-14 and 25-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

   a. The claim language in the following claims is not clearly understood:

      i.   As per claim 1, lines 3-6 recites that a second scheduler is loaded and activated. However, lines 6-9 recites that the address is patched to allow the scheduling request to be sent to the first scheduler. It is unclear why the scheduling request is being sent to the first scheduler when the second scheduler has been loaded and activated (i.e. Should scheduling request be sent to the second scheduler? Is the scheduling request being sent to the first scheduler after being sent to the second scheduler?).

      ii.   Claims 8 and 24 have the same deficiency as claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1, 3-8, 10-14, 24, and 26-31 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Chalmer et al. (US 7,296,271) in view of Applicant Admitted Prior Art

(AAPA) and Darlet et al. (US 2003/0122871).

4.   As per claim 1, Chalmer teaches the invention substantially as claimed including

a method for changing a first scheduler in a multitasking system (column 1 lines 48-58;

column 1 lines 62-67), comprising:

loading a second scheduler in the multitasking system (Schedulers may be

swapped out depending on runtime considerations or the situation.) (column 11 lines

34-67; column 12 lines 1-10); and

activating the loaded second scheduler to handle a scheduling request for a

scheduling process in place of the first scheduler (A loaded scheduler is activated to run

a process when it is invoked by either a periodic interrupt or by a software trap.)

(column 5 lines 13-22), wherein an address, corresponding to a function in a function

pointer array and associated with the first scheduler, is to be dynamically patched to

allow the scheduling request to be executed by the first scheduler directly (When a

scheduler is loaded, the scheduler starting address (program counter) and the stack

pointer are patched into the array of context blocks. The loaded scheduler is used to

execute the current process in the array of process elements.) (column 2 lines 14-19;

column 5 lines 13-22; column 7 lines 16-26; column 11 lines 34-54).

Chalmer does not specifically teach:

wherein the scheduler is in a virtual machine monitor;

the virtual machine monitor running when the second scheduler is loaded and

activated; and

wherein the address is patched in to the scheduling request.

However, AAPA teaches a scheduler in a virtual machine monitor (¶2).

It would have been obvious to a person of ordinary skill in art at the time of

invention was made to incorporate the teaching of Chalmer into the method of AAPA to

vary the scheduler based on runtime conditions. The modification would have been

obvious because one of ordinary skill in the art would utilize the method of Chalmer

because in a single scheduler/multiple algorithm situation, the scheduler may

experience significant overhead in connection with determining which scheduling

algorithm to run. In contrast, a multiple scheduler technique may avoid such overhead

(Chalmer, column 11 lines 47-54).

Chalmer does not specifically teach:

the virtual machine monitor running when the second scheduler is loaded and

activated; and

wherein the address is patched in to the scheduling request.

However, it would have been obvious to a person of ordinary skill in art at the time of

invention was made that the virtual machine monitor is running in order for the

scheduler to be changed. The modification would have been obvious because one of

ordinary skill in the art would utilize the running virtual machine monitor to allow

interaction with its scheduler. Actions may not be performed on or by a scheduler

located in virtual machine monitor unless the virtual machine monitor is running.

The combination of Chalmer and AAPA does not specifically teach wherein the

address is patched in to the scheduling request. However, Darlet teaches a request

that references an object and patching the address of the object into the request (¶1

lines 8-14; ¶2).

It would have been obvious to a person of ordinary skill in the art at the time of

invention was made to incorporate the teaching of Darlet into the method of the

combination of Chalmer and AAPA to have the request reference the object, instead of

having the object reference the request. The modification would have been obvious

because one of ordinary skill in the art would utilize the referencing of Darlet to

decentralize the tracking of addresses for requests and objects (¶1 lines 8-14; ¶2).

5.   As per claim 3, Chalmer teaches wherein the loading further comprises:

unloading the first scheduler from the virtual machine monitor before loading the

second scheduler (Only one scheduler is executed at a time. A program counter for a

first scheduler is modified to swap the first scheduler for a second scheduler.) (column 1

lines 48-54; column 1 lines 64-67; column 2 lines 1-2).

6.   As per claim 4, Chalmer teaches wherein the activating further comprises:

replacing a first scheduler identifier with a second scheduler identifier to route

between the second scheduler and a requester that generated the scheduling request,

when the virtual machine monitor is running (When a first scheduler is replaced by a

second scheduler, a program counter variable is modified to indicate the second

scheduler should be used. A scheduling request will then be routed to use the second

scheduler to handle a scheduling process.) (column 2 lines 9-14; column 5 lines 13-22;

column 11 lines 34-54).

7.   As per claim 5, Chalmer teaches wherein the activating further comprises:

replacing a first function pointer array pointing to a first function array of the first

scheduler with a second function pointer array pointing to a second function array of the

second scheduler to route between the second scheduler and a requester that

generated the request, when the virtual machine monitor is running (When a first

scheduler is replaced by a second scheduler, a stack pointer is modified to indicate the

second scheduler stack should be used. A scheduling request will then be routed to

use the second scheduler stack to handle a scheduling process.) (column 2 lines 14-19;

column 5 lines 13-22; column 11 lines 34-54).

8.   As per claim 6, Chalmer teaches wherein the activating further comprises:

        dynamically patching an address associated with the second scheduler into the

scheduling request when the virtual machine monitor is running (Running a scheduler

includes setting a program counter to an address corresponding the selected scheduler.

A scheduling request will invoke the scheduler corresponding to the address in the

program counter.) (column 1 lines 51-54; column 2 lines 9-14; column 5 lines 13-22).

9.   As per claim 7, Chalmer teaches:

        unloading the second scheduler from the virtual machine monitor when the virtual

machine monitor is running; and

        re-activating the first scheduler to handle a scheduling request after the second

scheduler has been unloaded (Schedulers can be set to alternate based on runtime

considerations. Schedulers alternating will repeat the unloading and re-activating steps

as necessary.) (column 11 lines 38-40).

10.   Claims 8 and 10 recites a virtual machine monitor for changing a first scheduler,

comprising the above steps. It has the same limitations of claims 1 and 3, respectively,

above and is therefore rejected using the same art and rationale as set forth above.

11.   As per claim 11, Chalmer teaches wherein the activating logic is

further to:

    replace a first scheduler identifier with a second scheduler identifier;

    route between the second scheduler as identified by the second scheduler

identifier and a requester that generated the scheduling request, when the virtual

machine monitor is running (When a first scheduler is replaced by a second scheduler,

a program counter variable is modified to indicate the second scheduler should be used.

A scheduling request will then be routed to use the second scheduler to handle a

scheduling process.) (column 2 lines 9-14; column 5 lines 13-22; column 11 lines 34-

54).

12.   As per claim 12, Chalmer teaches wherein the activating logic is

further to:

    replace a first function pointer array pointing to a first function array of the first

scheduler with a second function pointer array pointing to a second function array of the

second scheduler;

    route between the second function array pointed by the second function pointer

array and a requester that generated the scheduling request, when the virtual machine

monitor is running (When a first scheduler is replaced by a second scheduler, a stack

pointer is modified to indicate the second scheduler stack should be used. A scheduling

request will then be routed to use the second scheduler stack to handle a scheduling

process.) (column 2 lines 14-19; column 5 lines 13-22; column 11 lines 34-54).

13.   Claim 13 recites a virtual machine monitor for changing a first scheduler, comprising the above steps. It has the same limitations of claim 6 above and is therefore rejected using the same art and rationale as set forth above.

14.   As per claim 14, Chalmer teaches wherein the loading logic is further to unload the second scheduler from the virtual machine monitor when the virtual machine monitor is running; and the activating logic is further to re-activate the first scheduler to handle a scheduling request after the second scheduler has been unloaded (Schedulers can be set to alternate based on runtime considerations. Schedulers alternating will repeat the unloading and re-activating steps as necessary.) (column 11 lines 38-40).

15.   Claims 24 and 26-30 recites a machine readable medium comprising a plurality of instructions that in response to being executed result in an apparatus, comprising the above steps. It has the same limitations of claims 1 and 3-7, respectively, above and is therefore rejected using the same art and rationale as set forth above.

16.   Claims 2, 9, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Chalmer and AAPA as applied to claims 1, 8, and 24, respectively, above, and further in view of Knauerhase et al. (US 2005/0198303).

17.   As per claim 2, Chalmer teaches wherein the loading further comprises:

receiving a scheduler changing request to change the first scheduler (column 1

lines 64-67); and loading the second scheduler in the virtual machine monitor based

upon a scheduler parameter of the scheduler changing request (column 1 lines 59-61).

The combination of Chalmer, AAPA, and Darlet does not specifically teach

ceasing device resources owned by a running virtual machine in response to receiving a

scheduler changing request. However, Knauerhase ceasing device resources owned

by a running virtual machine in response to receiving a request (¶13 lines 4-5; ¶14 lines

1-13; ¶16 lines 3-5).

It would have been obvious to a person of ordinary skill in art at the time of

invention was made to incorporate the teaching of Knauerhase into the method of the

combination of Chalmer, AAPA, and Darlet to free the device resources. The

modification would have been obvious because one of ordinary skill in the art would

utilize the ceasing of resources of Knauerhase to allow an operation to complete without

interference from a running virtual machine (¶14 lines 1-13).

18.   Claim 9 recites a virtual machine monitor for changing a first scheduler,

comprising the above steps. It has the same limitations of claim 2 above and is

therefore rejected using the same art and rationale as set forth above.

19.   Claim 25 recites a machine readable medium comprising a plurality of

instructions that in response to being executed result in an apparatus, comprising

the above steps. It has the same limitations of claim 2 above and is therefore rejected

using the same art and rationale as set forth above.

20.   As per claim 31, the combination of Chalmer and AAPA teaches wherein the

virtual machine monitor is to comprise the function pointer array (Chalmer: column 2

lines 14-19; column 5 lines 13-22; column 7 lines 16-26; column 11 lines 34-54, AAPA:

¶2).

Allowable Subject Matter

21.   Claim 1 would be allowable if rewritten or amended to overcome the rejection(s)

under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and rewritten to

include all of the limitations of dependent **claims 2 and 3**.

22.   Claim 8 would be allowable if rewritten or amended to overcome the rejection(s)

under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and rewritten to

include all of the limitations of dependent **claims 9 and 10**.

23.   Claim 24 would be allowable if rewritten or amended to overcome the rejection(s)

under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and rewritten to

include all of the limitations of dependent **claims 25 and 26**.

Response to Arguments

24.   Applicant's arguments with respect to claims 1-14 and 24-31 have been

considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to BLAKE KUMABE whose telephone number is (571)270-

5593. The examiner can normally be reached on 7:30am - 5:00pm EST Monday to

Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. K./
Examiner, Art Unit 2195

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195